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ABSTRACT

This paper focuses upon three sets of information: first, information pertaining to research data about Research, Development and Diffusion (R. D. & D.) training; second, information pertaining to practices of current training programs; and third, information pertaining to expectations of potential employers of R. D. & D. personnel. Available evidence about R. D. & D. training programs seems to be reflected in the practice of programs surveyed. Changing pedagogical conditions with concomitant changes in the utilization of research, development and dissemination personnel, suggest both the existing research base on training practices and many training programs may be too narrowly conceived to cope with conditions. While colleges and universities continue to absorb most of the available "R" talent, they are in direct competition with local school districts, state and federal agencies, and independent research agencies for the few "D & D" specialists trained each year. As the demand for "D & D" talent increases, provision will have to be made for reliable suppliers. (Author)

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DEMOGRAPHIC DATA FOR TRAINERS OF EDUCATIONAL RESEARCHERS

Bernard J. Fleury, Jr.
Westfield State College

Emma M. Cappelluzzo
and
W. C. Wolf, Jr.
University of Massachusetts

March, 1970

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Available evidence about R. D. & D. training programs seems to be reflected in the practice of programs surveyed. Changing pedagogical conditions with concomitant changes in the utilization of research, development and dissemination personnel, suggest both the existing research base on training practices and many training programs may be too narrowly conceived to cope with conditions. While colleges and universities continue to absorb most of the available "R" talent, they are in direct competition with local school districts, state and federal agencies, and independent research agencies for the few "D & D" specialists trained each year. As the demand for "D & D" talent increases, provision will have to be made for reliable suppliers.

Demographic Data for Trainers of
Educational Researchers

Orientation

What kinds of institutions currently employ America's educational researchers? If the sample of educational researchers included in the National Register of Educational Researchers can be generalized, about two-thirds of the population are employed by colleges and universities, about sixteen per cent are employed by local school districts, about ten per cent are employed by governmental agencies, and the remainder are in the employ of foundations, research institutions and private businesses. Given the allocation of public and private fiscal resources for educational research and development in recent years, there is reason to believe this distribution must change.

Perhaps the models of the past are no longer adequate to cope with the realities of a rapidly changing social order with concomitant pedagogical changes. New requirements and needs for research, development, and dissemination talents within the educational community call for new training models, new personnel roles, and different models of R. D. & D. staff utilization. Before new models can be conceptualized, steps must be taken to gather needed baseline information about present practices. That is, information about research and development training considering the available research evidence, information about practices of current training programs, and information about the expectations of potential employers of R. D. & D. personnel, once obtained, can be analyzed to determine strengths

and deficiencies of conventional practice. Insights emerging from such analyses afford an opportunity either to modify existing training and staff utilization models or to conceptualize new models better suited to the educational changes taking place.

This paper focuses upon three sets of information: first, information pertaining to research data about R. D. & D. training; second, information pertaining to practices of current training programs; and third, information pertaining to expectations of potential employers of R. D. & D. personnel. Five prime sources and a number of secondary sources were drawn upon as the basis for generalizing about R. & D. training. Studies reported by Sieber and Lazarsfeld (1966), Buswell, McConnell, Heiss and Knoell (1966), Krathwohl (1966), Millikan, (1966), and Hopkins and Clark (in progress), were extensively utilized. Eighty five graduate level educational research training programs supported by the U. S. Office of Education, the total operating number of annual programs, constituted the population surveyed by questionnaire from which data pertaining to training practices were gleaned. The fifty chief state school officers, all of the school superintendents in the state of Massachusetts, and the directors of fifteen prominent independent research institutes, constituted the population surveyed by questionnaire from which data pertaining to employer expectations were gleaned.

Hence, this study is not based upon completely random samples. All of the chief state school officials, all of the USOE's operating research training programs, and all of the Massachusetts' Superintendents were included in the study. However, only fifteen research institutes were arbitrarily selected from among a large population of such agencies. Conclu-

sions must be weighed in light of these conditions.

Replies were received from all of the educational research training programs, forty seven of the fifty chief state school officers, one hundred seventy eight of the two hundred forty one Massachusetts superintendents, and eleven of the fifteen research institute directors.

Research About Research, Development and Dissemination Training

Generalizations presented in this sub-section are based upon research evidence made available through September, 1967. Much of this evidence was drawn from questionnaire surveys of pre-determined populations (6) and is descriptive of character. In comparison with other areas of education, the realm of educational researcher training and utilization is virgin inquiry territory. Once an extensive descriptive information foundation is established, it is not unreasonable to believe experimental studies of researcher training and utilization practices will become more commonplace.

Several research teams (cf. "Reference Cited") have reported results of studies which probed into relationships among recruiting procedures, program requirements and expectations, academic success, and subsequent performance on the job. The following suggestions stem from their work:

1. The level of student talent, as measured by standardized instruments such as the Miller Analogies Test and the Graduate Record Exam, is perhaps the most important entrance consideration for educational research training programs. Grade point averages are helpful but too diffuse to be used as a meaningful selection vehicle.

2. Prospective doctoral candidates and program graduates

who have earned bachelors and masters degrees in letters and science rather than in education, offer the greatest promise of educational R. & D. productivity.

3. Since more individuals who earn doctoral degrees under the age of 32 are productive on the job than individuals who earn doctoral degrees after age 40, age is a factor to be considered when selecting trainees and employees.

4. Since more individuals who earn doctoral degrees having had five or fewer years of educational experience are productive on the job than individuals who earn doctoral degrees having had six or more years of educational experience, prior educational experience is a factor to be considered when selecting trainees and employees.

5. Exposure to at least one statistics course during a training experience is related to productivity on the job.

6. A systematic apprenticeship program during a training experience is related to productivity on the job.

In addition, association with a research bureau or center and the economic resources for research activity within institutions of higher education seems to influence a trainee's subsequent job performance.

Available information suggests pronounced shortages of research, development, and diffusion talent within the field of education during the next four or five years. Diffusion specialists will be in particular short supply due to increasing demand and lack of training facilities. The scarcity of doctoral level educational researchers and the expense of employing personnel at this level combine to make a Masters Level training program a most desirable option worth serious consideration.

Practices of Current Training Programs

A bias was built into this study when a decision was made to survey the eighty five educational research training programs supported by the U. S. Office of Education. Since these programs were selected by referees from among hundreds of applicants, they are probably more innovative, more comprehensive, and better staffed than the over-all population of institutions engaged in training. This bias was not considered to be important, given the researchers' intentions.

Information was obtained from the eighty five programs about educational research roles being developed, entranced requirements, course requirements, field experiences, and research center affiliations. These data are reported in the following paragraphs. Occasionally, the number of responses exceed the total group sampled. In these instances, more than one response related to a given program.

A codification scheme utilized in the Hopkins-Clark (2) study proved to be a functional tool for handling data about educational research roles being developed within the eighty five programs. Tables One, Two, and Three portray data obtained.

TABLE 1

POSITION FOR WHICH TRAINEE WILL BE PREPARED

Primary Program Emphasis		Number of Programs
1. Research:	(a) engaging in basic inquiry (b) investigating research algorithms and modus operandi (c) engaging in exploratory and feasibility studies	80
2. Development:	(a) inventing technical solutions to problems in school settings (b) engineering packages and programs for school use (c) engaging in evaluation and assessment work	20
3. Diffusion:	(a) communicating with target settings (b) displaying innovations in target settings (c) training personnel to use innovations in target settings (d) servicing and nurturing adopted innovations	5

TABLE 2

LOCUS OF PROBABLE TRAINEE EMPLOYMENT

Primary Setting	Number of Programs
1. Public School Systems	31
2. Colleges and Universities	25
3. State or Federal Agencies	21
4. Independent Research Institutions	11
5. Not specified	43

TABLE 3

TASKS TO BE PERFORMED BY TRAINEE WITHIN INSTITUTIONAL SETTING

Primary Task	Number of Programs
1. Personally sustained research, development or diffusion work	71
2. R. D. & D. team leadership or staff participation	36
3. Stimulation and coordination of R. D. & D. activities	4
4. Technical consultation	2

Table Four depicts entrance requirements established for admission to the programs surveyed. Factors such as tests, grade point average, academic background, prior work experience, and age are considered.

TABLE 4

ENTRANCE REQUIREMENTS ESTABLISHED FOR ADMISSION TO TRAINING PROGRAMS

Factor	Number of Programs
A. Tests	
1. Miller Analogies	
a. May be, usually, or always required	40
(1) no set score	25
(2) "High" score	4
(3) set score of: 70 plus	3
60 plus	2
50 plus	2
40 plus	1
(4) score in upper 15%	1
35%	1
50%	1
b. suggested or preferred	2

c. suggested or preferred that applicant take M.A.T., G.R.E. or other test 2
d. not mentioned in proposal or catalog of institution sponsoring the Research Training Program 41

N = 85

2. Graduate Record Examination
   a. One or more sections of G.R.E. may be, usually, or always required 63
      (1) no set scores 40
      (2) superior performance 6
      (3) combined Verbal and Quantitative scores of: 1200 plus 3
          1100 plus 1
          1000 plus 5
      (4) Verbal Scores of: 500 plus 4
          450 plus 3
      (5) Quantitative Scores of: 600 plus 1
          500 plus 5
          450 plus 3
          above 50th percentile..... 1
   b. Accepted, suggested or preferred 2
      (1) No set scores 2
   c. Suggested or preferred that applicant take M.A.T., G.R.E. or other test 2
   d. Not mentioned in proposal or catalog of institutions sponsoring the Research Training Program 18

N = 85

3. Other test (required, accepted or suggested)
   a. Dopp. Math Reasoning 7
   b. S.C.A.T..... 3
   c. Coop. and other English Tests 6
   d. Dept. Qualifying Exams 2
   e. National Teachers Exam 7
   f. Minn. Multiph. Personality Inventory 1

N = 26

B. Grade Point Averages (adjusted to four point scale).
   1. Graduate 6
      a. G.P.A. of: 3.5 1
         3.0 5
   2. Undergraduate 35
      a. G.P.A. of: 3.5 1
         3.0 29
         2.5 4
         2.0 1

3. no set score or not mentioned 44

N = 85

C. Academic background required or preferred
   1. Bachelor's Degree from an accredited four-year College or University 85
      a. Major in one of the Behavioral Sciences 10
      b. Major in the Social, Physical Sciences or Humanities 21
      c. Major in education 7
      d. No particular major preferred 47
   2. Master's Degree from an accredited four-year College or University 17
      a. Major in one of the Behavioral Sciences 3
      b. Major in the Social, Physical Sciences or Humanities 6
      c. Major in education 4
      d. No particular major preferred 4

   * Some programs require both Bachelor's and Master's Degrees — N = 102*

D. Experience or Certification requirements or preferences
   1. "Professional" school related experience:
      a. required 6
         (1) number of years: two 2
         (2) no set number 4
      b. preferred 3
         (1) number of years: no set number . 3
   2. Teaching and/or Administrative experience:
      a. required 17
         (1) number of years: three plus..... 3
                              two plus..... 1
                              one plus..... 2
         (2) no set number 11
      b. preferred 12
         (1) number of years: three 1
                              two 1
         (2) no set number 10
   3. Teaching, Administrative or other Professional school related experience not mentioned or specifically not required 47

N = 85

E. Age ... required or preferred limits at date of admission
   40 to 49 4
   35 to 39 4

30 to 34	4
25 to 29	1
No set age but younger qualified applicants preferred	2
Age not mentioned	70
N =	85

The surveyed training programs spelled out an extensive list of courses for trainees in their proposals to the USOE and in their institutional program literature. Nearly all of the programs offer a common core of experiences required of all trainees. Beyond the core, programs tend to be tailored to the needs and interests of participating individuals. Table Five sums up course requirements indicated.

TABLE 5

DESIGNATED COURSE REQUIREMENTS

A. Cognate Discipline (Psychology, Sociology, Anthropology, etc.)	
1. Major in cognate Discipline (30 hours or more)	42 programs
2. Core of research related courses in Cognate Discipline	14 programs
3. Minor in Cognate Discipline (15 to 29 hours)	5 programs
B. Research Methodology	
1. Statistics	
a. Introductory (Descriptive and Inferential Statistics, Parametric, Tests of Significance)	36 courses
b. Intermediate (Up through simple analysis of variance & covariance)	56 courses
c. Advanced (non-parametric, complex analysis of variance & covariance, factor analysis)	72 courses
d. Unspecified "Statistics" courses (recorded as one course only)	17 courses

2. Educational Research Methods
   a. Educational Research Methods (General or Introductory)..... 65 courses
   b. Special Educational Research Methods for a particular area (Handicapped, etc.) ..... 21 courses

3. Research and Experimental Design
   a. Research and Experimental Design (General)..... 67 courses

4. Tests and Measurements
   a. Tests and Measurements (includes: Evaluation, Construction of Education Tests, Scaling and Related Techniques and Introduction to Test Theory)..... 96 courses

5. Computer Programming and Applications ..... 52 courses

6. Data Processing (excluding computer or including computer but as part of course only)..... 15 courses

7. Research Diffusion (including seminars on change processes in education) ..... 6 courses

8. Administration of Research ..... 3 courses

Both the nature of apprentice-type research and development experiences and the setting within which they are offered vary considerably. Data treating time allotments, settings, supervision, and offered experiences are reported in Table Six. The variety of strategies employed by program directors to include practical research experiences presented a problem. Their statements were so diverse, codifying them in a concise manner proved to be an impossible task. Even though the following chart seems somewhat diffuse, it accurately reports all of the options.

TABLE 6

DESIGNATED APPRENTICE-TYPE PROGRAM REQUIREMENTS

Factor	Number of Programs
A. Time allotments for practicum and/or Apprenticeship, Internship Experiences	
1. "Part-time" (unspecified) from one summer session to one quarter to four years. Ten of these programs fall in the one to three year range.	17
2. Five to fifty-seven semester hours with eleven of these programs in the five to fifteen semester hour range.	15
3. One to two years with eleven of these programs in the one year category with the amount of time per year unspecified.	12
4. One fourth time per week for from one semester to three years.	10
5. One half time per week for from one semester to duration of program.	9
6. Full time from five weeks to one year.	9
7. No reference in their proposals to time allotments for Practicum or Internship requirements.	6
8. One hundred to one thousand clock hours.	4
9. One to five quarters (twelve weeks each) with the amount of time per quarter unspecified.	3
	N = 85
B. Setting for Practicum and/or Apprenticeship, Internship Experiences	
1. Provide these experiences in a University or College on-campus Research Bureau or other related Educational Agency.	44
2. Do not specify the setting of these experiences.	27
3. Provide these experiences in a Public School setting.	25
4. Provide these experiences in Research and Development Centers, either on or off campus.	6
5. Provide these experiences in State Departments of Education.	5
6. Mention "appropriate" educational settings only.	4
7. Provide these experiences in Independent Research Institutions.	3

8. Provide these experiences in Federal Agencies. 2
9. Provides these experiences in a hospital. 1

N = 117*

* Some of the programs provide Practicum and/or Apprenticeship, Internship Experiences in several settings which accounts for an N of 117 for the eighty five programs.

C. Supervision of the Research Practicum and/or Apprenticeship, Internship Experiences.
   1. Specify the University or College as primarily responsible for supervision. 79
   2. Do not specifically assign supervisory responsibility. 4
   3. Specify a joint University-School system supervisory responsibility. 2

N = 85

D. Experiences offered as part of the Research Practicum and/or Apprenticeship, Internship Arrangements.
   1. Participate in on-going campus or off-campus research project. 18
   2. Independent research (engage in experimental studies) may be connected with seminars or research practicum course requirements. 18
   3. "Continuous progress" - proceed from being an observer of the research process to being a participator in the simple routine tasks (such as data gathering) to more skilled creative independent work. Research experience may take place in several settings. 15
   4. "General" experiences - involvement as a research apprentice or intern is required in an "appropriate" research experience - supervised research activities. 13
   5. Research and field work in certain specified areas - group and/or individual investigation. 12
   6. Independent study, intern, under a professor actively engaged in research. 11
   7. Assist University faculty and/or public school system in conducting research studies - serve as an apprentice in university or public school setting. 6
   8. Report writing and other diffusion aspects of research. 4
   9. Research consultant to other students and off-campus educational groups. 4
   10. Research centered on dissertation. 3

11. Develop an instructional device and field test it.	2
12. Research experiences unspecified.	1
	N = 107*

* In ten of the eighty-five programs it was specified that research experiences take place in two or more settings.

** Some programs indicate several experiences to be offered, thus N = 107 for the eighty five programs.

Finally, proximity to a research bureau or center seems to influence the behavior of trainees enrolled in surveyed research and development programs. Seventy five of the eighty five programs contacted, revealed close association with established bureaus and centers. Such contact seems to influence trainees' study patterns, apprenticeship experiences, and the relative value of course work offered.

According to Sieber and Lazarsfeld (4) the beneficial influence of the research bureau may stem from the availability of project directors within a research unit to conduct seminars, and ready access, within research bureaus, to projects for case studies of on-going research and for data.

Expectations of Employers of R. D. & D. Personnel

Information was obtained from the State Commissioners of Education, superintendents of local school districts, and directors of independent research agencies. Data gathered focused upon trainee employment possibilities, level of training, nature of training (considering course requirements, and field experiences), prior teaching experience, and certification. These data are reported in the following paragraphs. Again, multiple re-

sponses to specified item options may cause the number of responses to exceed the total group sampled.

Since information presented earlier in this paper revealed that colleges and universities are the most likely employers of individuals trained for research and development work, an effort was made to ascertain the interest of individuals outside that context in hiring program graduates. Table Seven reports their probable interest in employing qualified program graduates.

TABLE 7

FULL-TIME EMPLOYMENT POSSIBILITIES FOR PROGRAM GRADUATES OTHER THAN IN INSTITUTIONS OF HIGHER EDUCATION

Prospective Employer	Employment Possibility		
	Yes	No	No Response
1. State Departments of Education	44	2	1
2. Local School Districts	51	116	11
3. Independent Research Agencies*	11	1	2

NOTE: * More than one director in a given agency responded to the survey; hence, fourteen responses were received from ten agencies in this instance.

Even though only about one in four local school superintendents were likely to hire full-time researchers, more than two out of three expressed interest in sharing a person with one or more neighboring districts. Employer attitudes differ when considering desirable vs. practical (likely to hire) academic levels of educational research, development and dissemination training.

Massachusetts' Superintendents of Schools selected the sixth year or Certificate of Advanced Graduate Study level (35% modal pattern of response) as the most desirable level, but chose the Master's (42% modal pattern of response) as the practical level. The State Departments of Education favored the Doctoral level (40% modal pattern of response) as the most desirable academic level, but chose the Master's level (39% modal pattern of response) as the practical level. Of the three employer groups surveyed, only the Independent Research Institutes checked the same Academic level, the Doctoral level (30% modal pattern of response) as being both the desirable and practical level for the training of educational researchers. Insofar as course context within these degree programs is concerned, all three employer groups agree that training in statistics is of paramount importance. Data obtained revealed 37% of the state department respondents, 42% of the local school superintendents, and 37% of the independent research agency respondents place prime emphasis upon such training. Educational research methods, experimental design, evaluation strategies, and test know-how were also mentioned.

Table Eight reports apprentice-type experiences that would be a most appropriate part of a training experience for educational research training programs in the opinion of prospective employers. Responses obtained were codified under three headings: first, public school teaching and/or administrative experience; second, carefully supervised internship experiences designed to cover all levels of the educational community; and third, college or university based practicum experiences involving problem identification, data acquisition and analysis, and reporting results obtained.

TABLE 8

APPRENTICE-TYPE EXPERIENCES DEEMED MOST APPROPRIATE AS AN INTEGRAL PART OF TRAINING PROGRAMS OFFERED

Prospective Employer	Modal and Near-Modal Responses of Employers Expressed as a Percentage of Total Response		
	Public School Teaching and/ or Administrative Experience	Supervised Internship of a General Nature	Problems -- Oriented College Practicums
1. State Departments of Education	29%	26%	26%
2. Local School Districts	20%	11%	24%
3. Independent Research Agencies		25%	44%

Prior educational experience is considered to be an important part of an educational researchers experience in the opinions of most individuals surveyed. Table Nine presents surveyed individuals' views toward teaching experience and eligibility for certification.

TABLE 9

PRIOR TEACHING EXPERIENCE AND ELIGIBILITY FOR CERTIFICATION WHICH EMPLOYERS OF EDUCATIONAL RESEARCHERS CONSIDER TO BE IMPORTANT

Prospective Employer	Modal Response of Employers Expressed as a Percentage of Total Response				
	Essential	Highly Desirable	Desirable	Unimportant	Undesirable
1. State Departments of Education		40%			
2. Local School Districts	50%				
3. Independent Research Agencies			43%		

An interesting characteristic of the data distribution for independent research agencies is worth noting. Whereas 43% allowed that prior pedagogical experience is desirable, 36% believed such prior experience to be unimportant.

State department of education officials were also asked to react specifically to the type of certification needed by educational researchers seeking employment within local and state education agencies. More than half responded that a standard teaching or administrative certificate would be required. About one in four replies observed that special provisions for certification were needed, but less than half of this number expressed interest in creating such an avenue. One in six expressed the opinion that no certification should be required.

Interpretation

Data about research on research, development and dissemination training, practices of current training programs, and experiences of employers of R. D. & D. personnel, provide a frame of reference within which the following interpretations are made. Four overarching interpretations are offered, treating points of similarity and divergence within the prescribed parameter. For example:

First, available evidence suggests there will be shortages of research, development, and diffusion personnel for the field of education in the immediate future (2). Diffusion specialists will be in especially limited supply. The training programs of interest in their present form, are not structured to cope with the developmental and diffusion personnel needs expressed; however, they are geared to supply candidates for conventional re-

search roles (i.e., college level) now in demand. Employers see a need for the technician-scholar (a person with strength in a cognate discipline as well as in techniques of research) in their agencies; however, both the applied character of much work under way and the nature of employment within their agencies calls for more pragmatic employment practices. Thus, if the demand for R. D. & D. personnel materializes, the surveyed training programs may be able to service only one aspect of it well. In addition, surveyed employers may be called upon to initiate intensive in-service training programs to meet agency requirements for talent other than at the technician-scholar level.

Second, the personnel projections for R. D. & D. types in the immediate future implies a need for programs at a level other than the doctorate. The scarcity of doctoral-level talent and the financial commitment needed to attract researchers with a doctorate combine to argue in behalf of initiating masters level or six year type training programs. While employers are receptive to hiring individuals with such training, only eight of the eighty-five programs surveyed provide such opportunities. More non-doctoral training programs appear to be in order if tomorrow's educational personnel needs are to be met.

Third, information pertaining to research on existing R. D. & D. training programs relates candidates training program and subsequent job performance success to considerations such as the following: (a) performance on standardized measuring instruments (i.e., the Miller Analogies Test, etc.); (b) bachelors and masters degrees earned outside the field of education; (c) age; (d) amount of prior pedagogical experience; (e) exposure to some work in statistics as a part of their training; and (f) participation in an ap-

prenticeship experience associated with an educational research, development, and dissemination bureau or center. Most programs utilize standardized test information in conjunction with student selection; however, a minority of these programs take into account -- on a formal basis at least -- other important factors like age, nature of academic background, and amount of prior educational experience. Most provide statistics training and most require candidates to serve an apprenticeship in an educational center or bureau. Employers also look for statistics training and apprentice-type experiences when interviewing candidates for job openings; however, they also weigh heavily candidates' prior pedagogical experience and certification status. Trainers and employers seem to be operating at cross-purposes in terms of candidate selection, job responsibilities, and exposure to the field of education. Since trainers tend to focus upon college and university employment possibilities, this disparity can be understood. As other employers increasingly call upon R. D. & D. personnel trainers for talent, it is not unreasonable to believe the trainers will respond with appropriate alternatives.

Fourth, several additional items of interest relate to the above-mentioned interpretation. First, whereas most programs focus upon the "R" of R. D. & D. and train individuals to conceptualize and sustain research work, at least fifty-two of the programs indicate graduates of their programs will meet personnel needs of local school districts, and state or federal agencies. Given the prior educational experience and certification expectations expressed by employers, their desire to share R. D. & D. personnel with other agencies as one means of defraying costs involved, and their recognition that pre-doctoral training is probably both practical and

realistic given the operation of the marketplace, perhaps training program graduates may not be marketable within most local school districts and most state and federal agencies. Second, whereas the Hopkins and Clark (2) report as well as the views of employers emphasize versatility on the part of individuals seeking R. D. & D. roles, most programs surveyed train candidates for the "R" part. In-service training may be the most expeditious means of developing "D. & D." competencies in the near future.

Conclusion

Available evidence about R. D. & D. training programs seems to be reflected in the practice of programs surveyed. However, changing pedagogical conditions with concomitant changes in the utilization of research, development and dissemination personnel, suggest both the existing research base on training practices and many training programs may be too narrowly conceived to cope with conditions. While colleges and universities continue to absorb most of the available "R" talent, they are in direct competition with local school districts, state and federal agencies, and independent research agencies for the few "D. & D." specialists trained each year. As the demand for "D. & D." talent increases, provision will have to be made for reliable suppliers.

Specific conclusions based upon these data include the following:

(1) That there will be shortages of R. D. & D. personnel for the field of education in the immediate future;

(2) That training programs studied are not structured to cope with the development and diffusion personnel needs expressed;

(3) That employers surveyed may be called upon to initiate intensive in-service training programs to meet

agency requirements for talent other than at the technician-scholar level;

(4) That a need for programs at a level other than the doctorate exists to meet employer requirements;

(5) That trainers and employers seem to be operating at cross-purposes in terms of candidate selection, job responsibilities, and exposure to the field of education;

(6) That employers emphasize versatility on the part of individuals seeking R. D. & D. roles, whereas most training programs surveyed prepare candidates for the "R" part.

Institutions of higher education now charged with a research training responsibility ought to consider ways of expanding their operations, or assist other institutions to develop applied research, development and dissemination training opportunities. And, these training agencies ought to relate their building and remodeling plans to realities in the field of education. Such action would provide talent for conventional research roles as well as applied research, development and dissemination talent for roles coming into existence.

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